Magnus® Rotary Steerable System

Drills 17 1/2-in. Hole Section in Just One Run, Saves 7 Hours of Rig Time, With No NPT

Objectives

- Maintain a vertical well trajectory.
- Improve drilling time compared with offset wells.
- Eliminate nonproductive time (NPT) related to tool failures and service quality issues.

Our Approach

- The Weatherford drilling engineering team conducted a thorough review of the scope of work (SOW), including well trajectory, bit selection, and the drilling fluid program. As part of this process, the team analyzed data from offset wells and conducted a risk assessment to identify drilling hazards as well as best practices. Their analyses prompted the team to develop steps to counter potential downhole problems:
  - Monitor drilling dynamics in hard and abrasive formations, and mitigate downhole stick-slip problems using a true vibration monitor (TVM) in the measurement-while-drilling (MWD) string.
  - Develop connection and tripping procedures as well as mud programs to mitigate unstable formations, swelling, caving, and caverns.
  - Optimize the bottomhole assembly (BHA), hydraulics, torque and drag, and shock-and-vibration regimes using Weatherford engineering protocols.
  - Manage the hole-cleaning program.
- The team deployed the Magnus RSS and HEL™ MWD system with BAP™ bore and annular pressure sensor. Drilling with a polycrystalline diamond compact (PDC) drill bit from 1,079 to 4,934 ft (329 to 1,504 m), the RSS adjusted the steering bias to use only the force required to maintain a vertical trajectory.
- The RSS reached the desired section depth at 4,934 ft (1,504 m) MD without NPT in only 281 hours instead of the 288 hours projected in the SOW.

Value to Customer

- The Magnus RSS maintained a vertical trajectory, with a maximum 1.25° inclination, despite influences from formation dip. The Weatherford team finished drilling the 17 1/2-in. section 7 hours faster than planned.
- By developing appropriate measures in response to unique well conditions, the Weatherford team was able to drill to the target depth in just one run, with zero NPT.

The Magnus RSS 1100 reached the desired depth in the 17 1/2-in. section of the onshore, vertical well faster than expected.

LOCATION
Poland

WELL TYPE
Onshore, exploratory, vertical

FORMATION
Carpathian Flysch

HOLE SIZE AND MAXIMUM INCLINATION
17-1/2 in., 1.25°

CASING SIZES AND TYPES
- 18 5/8-in. conductor to 991 ft (302 m) MD
- 13 3/8-in. casing at 4,934 ft (1,504 m) MD

TEMPERATURE
144°F (62°C)

SECTION DEPTH
From 1,079 to 4,934 ft (329 to 1,504 m)

PRODUCTS/SERVICES
- Magnus RSS
- HEL MWD system
- BAP bore and annular pressure sensor

